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THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

Volume XXIII Number 8

May 1, 1939

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII Number 8

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Reports on cereal diseases, page 136, include notes on cereal rusts in Texas by E. S. McFadden and by I. M. Atkins, and on unusual prevalence of powdery mildew in California by C. A. Suneson.

What is apparently the first report of Macrophomina phaseoli on Strophostyles is made by Howard W. Johnson, from Georgia, page 138.

Brief notes on plant diseases, page 138, include reports on dodder on tomato in Texas, by P. A. Young; lettuce diseases in North Carolina, by O. P. Owens; and tobacco downy mildew in Virginia, by S. B. Fenne.

NOTEWORTHY FLORIDA AND GEORGIA FUNGI

Vera K. Charles

The following fungi were collected in Florida and Georgia during the months of December 1938 and January 1939. They are either new to the United States or of sufficiently rare occurrence to warrant comment. The specimens have been placed in the Mycological Collections of the Bureau of Plant Industry and also insofar as material permitted in the herbarium of the Florida Agricultural Experiment Station at Gainesville.

Oidium caricae Noack on Carica papaya: This fungus was described by Noack (8, p. 81) from Brazil in 1898, and in 1907 was listed by H. & P. Sydow (12, p. 362) in their paper on Noack's Brazilian Fungi. In 1918 Reinking (10, p. 183) reported a mildew on Carica papaya but did not consider it serious. Later in 1919 (11, p. 43) there is another reference to it by the same author. The fungus is mentioned as a mildew and classified under the Erysiphaceae.

In 1921 Whetzel (14) observed that the most serious disease of "papaws" (papaya) in Bermuda "appears to be a mildew caused by some species of Erysiphaceae". He stated that the fungus produced large patches on the upper surface of the leaves causing yellowing and premature dying. Ths disease was reported as being especially severe on seedlings. Dusting with sulphur was said to be very effective. A powdery mildew on Carica papaya was reported in 1933 by Taubenhaus and Ezekiel (13, p. 26). A specimen sent from Florida in 1922 was tentatively referred at the time to Noack's species and material gathered near Winter Haven by the writers positively confirms the occurrence of this fungus in that State. No further published reports of the fungus in the United States have been found. The mildew is quite conspicuous as it occurs on the upper surface of the leaves and in the early stage is in sharp contrast to the clear green of the papaya leaves.

This Oidium of the Florida collection corresponds morphologically with Oidium caricae Noack, but as previously remarked it develops on the upper surface of the leaves instead of the under surface as described for this species. The same observation was also made by Whetzel (l.c.). Taubenhaus and Ezekiel (l.c.) do not mention on which surface of the leaves their fungus appeared.

This Oidium should not be confused with Ovulariopsis papayae van der Bijl. In the description of this latter species (3) the conidial measurements are given as averaging 72x14 microns which considerably exceeds the measurements for O. caricae. In addition the conidia are borne singly and are definitely subclavate.

Hypocrea cyperacearum Berk. & Curt. on Cyperus retrorsus: This collection was made at Highlands Hammock. Unfortunately the material was

quite old, although present in considerable quantity. According to Dr. W. W. Diehl it has been reported only three times previously; once in British Guiana, once in Dutch Guiana, and the third time at Snead's Island, Florida. The exact location of the present collection is definitely marked, and it is hoped that fresh material showing the conidial stage may be secured a little later in the season.

Ramularia sidarum Petr. & Cif. on Sida acuta: The Mycological Collections contain a specimen from the type collection of this species on Sida spinosa as cited by Ciferri under his number 4034, and a second on Sida acuta, Ciferri, no. 3960, both from the Dominican Republic. A gathering made near Melbourne makes possible the first report of this fungus in the United States. It is evidently a true parasite as it produces definite diseased areas. The relation of the host to certain important economic plants may render the fungus of more than passing interest.

Boletus conicus Rav.: This fungus was collected in South Carolina and described in 1853 by Ravenel (in 2, p. 430). It was cited in literature as known only from the type locality until 1933 when it was rediscovered in Florida by H. C. Beardslee (1, p. 263). The past winter several specimens were found by the writer at Big Tree, Florida, and one fine large specimen at Highlands Hammock. The latter specimen was found at the edge of the hammock in an exposed position. Both collections were made in mixed woods, not pine woods as described as the habitat of the type material. On account of the pink color of the spores Beardslee assigns this species to the genus Tylopilus, rather than to Ceriomyces as designated by Murrill (7, p. 146).

Boletus conicus is an interesting plant not only because of its history, but also because of its striking appearance. It is covered with appressed, fasciculate flocci which are in strong contrast with the white of the pileus.

Cerebella andropogonis Ces. on Tricholaena rosea: This fungus, collected at Gotha, is tentatively listed as C. andropogonis. It is being grown in culture to determine its taxonomic position definitely. There are few reports of its occurrence in the United States and no record of it on Natal grass, although the Mycological Collections has a specimen of Cerebella from Brazil on this host which appears to be identical.

Puccinia obliqua Berk. & Curt. on Metastelma scoparium: This species was found to attack the very young plants, but was not observed on older plants which had lost their leaves. The fungus has been reported on other species of Metastelma but apparently not on M. scoparium. The collection was made at Highlands Hammock.

Puccinia jussiaeae Speg. on Isnardia repens: P. jussiaeae has been reported from California on Isnardia repens, but no published record was found of its occurrence in Florida. The place of collection was again Highlands Hammock.

Fusarium merismoides Cda.: This fungus was found abundantly at the Savannah Bamboo Garden on freshly cut bamboo canes. It is conspicuous because of the abundant production of salmon-colored gelatinous conidial masses.

Uredo guaynabensis Kern & Whet. on Jussiaea peruviana: This fungus was found to be very abundant at Highlands Hammock and was also collected on the same host near Vero Beach. The species was described by Kern and Whetzel (6, pp. 41-42) from Puerto Rico in 1926 on Jussiaea angustifolia. The authors state that they also examined material on J. angustifolia from Jamaica and on J. peruviana from the Isle of Pines and found the three collections to be identical.

Testicularia cyperi Klotz on Rynchospora corniculata: Several fine specimens of this striking smut were found in Highlands Hammock and in an adjacent cypress swamp. The white papery sori developed mostly at the apex of the host plant some six feet up in the air, resembling diminutive fire crackers.

Testicularia appears to be of rather rare occurrence. Clinton (4) lists but one collection in North America, that of E. S. Miller at Wading River, New York, about 1879. For this fungus Peck (9, p. 40) established a new genus, Milleria, which he considered a Gasteromycete near Polysaccum. Subsequent collections have increased the known range of this species, it having been reported from Louisiana, Texas, Florida, and possibly other States. The germination of the spores was worked out by Edgerton and Tims (5), who showed it to be characteristic of the family Ustilaginaceae.

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(Division of Mycology and Disease Survey).

NOTES ON THE OCCURRENCE OF COLEOSPORIUM CROWELLII CUMMINS IN THE UNITED STATES

George G. Hedgcock

Coleosporium crowellii, a unique rust, was described by George B. Cummins in Phytopathology 28: 522-523, 1938, from collections in New Mexico. This fungus has been collected by members of the Division of Forest Pathology and others beginning in 1916. Specimens were sent to Dr. John Dearness for determination. On August 27, 1927, he gave the fungus the herbarium name Hedgcockia ligulae, which he changed to Coleosporium ligulae in April 1935. He has not published a description of the species.

The rust is now reported as follows on Pinus edulis: In New Mexico--Hell Canyon, Manzanita National Forest, Carl Heinrich, Sept. 18, 1916; Santa Fe, G. G. Hedgcock and E. Bethel, May 19, 1917. In Colorado--

Cornwall, G. G. Hedgcock and E. L. Johnston, June 18, 1917; Bayfield, W. H. Long, June 26, 1917; Trimble Hot Springs, N. R. Hunt and E. Bethel, June 23, 1918, and E. Bethel Sept. 15, 1918; Fort Collins, F. C. Craighead, Aug. 1927. In Arizona--Mesa Verde National Forest, W. H. Long, Oct. 20, 1928.

(Division of Forest Pathology).

NOTES ON COLEOSPORIUM CROWELLII

John Dearness

For what other pathogenic fungus than Coleosporium crowellii Cummins have scientists longer sought a place in taxonomic literature?

More than 22 years ago--the period covered by the oldest example of this species of rust now at my hand--the entomologists decided it was not in their field. They were the first investigators probably because two or three kinds of gall-mites were known to inhabit living needles of the pinon. In the absence of evidence of insect production it was referred to the mycologists.

Peridermioid to the naked eye, the orange tongues protruding from both sides of the living needles proved on sectioning to be hard and solid. The spores were exceedingly elusive but withal rust-like and, if a rust, an unrecorded species. The spores were found to be catenate with other characters of Coleosporium teliospores--a genus defined as having telia not on pines but on herbaceous dicots. It is now an interesting adopted child in a Coleosporium household; one of a pair, the other being C. pinicola.

Possessing material from the late Professor Ellsworth Bethel and portions of a half-dozen or more collections from Dr. Hedgcock, and often made more conspicuous by a dark parasitizing Cladosporium, and all on living needles of Pinus edulis, scattered from Larimer County in the north of Colorado to Albuquerque in New Mexico and Flagstaff in Arizona, I was led to believe that this rust is co-extensive with its host and limited to it. By the favor of Dr. Crowell, Macdonald College, Quebec, I have a co-type of the form on Pinus flexilis taken near the south boundary of New Mexico. On this host, or at least in this specimen, it is less conspicuous, and compared with the usual form on P. edulis seems more like an accidental tenant than a permanent resident.

The type specimen on P. edulis is reported by Dr. Crowell as collected in Otero County, New Mexico, July 3, 1937, fide Dr. Cummins' description.

FURTHER REPORTS ON APPLE SCAB

MASSACHUSETTS: In the college orchard on April 7, with McIntosh buds slightly swelled, perithecia of Venturia inaequalis were abundant and prominent in the surface leaves. However, only an occasional perithecium contained even a colorless spore. On the fourteenth, surface leaves from the same trees, representing those that dropped late in the season, showed a marked development of perithecial contents during the past week while the fruit buds advanced very little. Most of the perithecia contained septate hyaline spores, and about one-fourth of them contained up to 10 percent colored spores.

As would be expected, leaves that dropped at the time of the hurricane on September 21 showed much more advanced condition of scab perithecia. Most of the latter contained some mature spores, and at least half of them showed 25 to 75 percent of the spores mature and shooting vigorously in the microscope mount but very sparingly in traps. In past seasons, spore maturity has been observed to be much earlier in leaves that drop early in the fall or in leaves that lie in direct contact with the earth than in leaves that drop late in the season or that lie on the surface of a mulch or of a thick sod. (O. C. Boyd, Massachusetts State College.)

RHODE ISLAND: This initial weekly report for the 1939 season is later than it usually has been because of the backward season. The slow development of the fungus in the overwintered leaves and the late development of the apple cluster-buds are indicated below.

Examination of overwintered McIntosh leaves have shown practically no spores until after the rain of April 18 to 20 but now the fungus is developing very rapidly with the warmer weather. Colorless spores are now abundant but no mature spores have been seen. Apple buds had swollen but were not showing silver tips until April 20. On April 22 they ranged from "silver tip" to the "green tip" stage. It appears that with the present bright, warmer weather the "delayed dormant" application will go on between April 24 and 29. During this period we may expect a rain which will cause a few spores to be shot. (Frank L. Howard, Rhode Island Agricultural Experiment Station, April 22.)

NEW YORK (Hudson Valley): Apple scab ascospores have matured rapidly during the past week and in some orchards are now almost fully mature. McIntosh leaves from Modena (Ulster County) collected April 21 had over 90 percent of the perithecia ready to discharge spores when placed in water in the laboratory. Leaves collected in Dutchess and Columbia Counties were in about the same stage of development.

A light discharge was recorded from leaves out doors following rain on the 18-19th and a greater discharge was recorded on April 22 following showers during the night. The next rain will probably result in a moderate discharge in scabby orchards. (D. H. Palmiter, New York State College of Agriculture, April 22.)

SOME REPORTS ON DISEASES OF CEREALS

CEREAL RUSTS IN TEXAS: College Station--None of the cereal rusts, with the exception of leaf rust [Puccinia rubigo-vera tritici] of wheat, has so far made its appearance in the cereal nursery. However, the stage appears to be already set for another heavy infestation of leaf rust in our wheat nursery. The lower leaves of all susceptible varieties of wheat are now showing a fairly heavy and uniform infection. The disease was about a month later than last year in making its initial appearance in the nursery, but its spread has been very rapid during the past month.

There has been, for the past two months, a heavy and uniformly distributed infection of leaf rust in a plot of mixed wheat growing out back of the Station buildings. This plot was seeded early in the fall and was well established at the time of the first "norther" which occurred around the middle of November. The wheat nursery, which is located about a half mile west of this plot, had not emerged at the time of the November norther. The first infection centers of leaf rust were not found in the wheat nursery until about six weeks after the uniform infection was observed in the plot back of the Station buildings. This suggests the possibility that the November norther may have brought inoculum from the wheat fields farther north and that very little inoculum has been brought in since that time. As a matter of fact, no characteristic northers were experienced in this part of Texas from the middle of November until February 20.

On February 21 several spores of both stem [P. graminis] and leaf rust were trapped on microscope slides exposed during a norther. If any of the spores in this shower were viable, infection centers of stem rust in the second generation should make their appearance within the next few days, since it usually takes from 12 to 14 days per generation under our February and early March conditions. (E. S. McFadden, March 15. Cereal Courier 31: 22. April 10.)

Denton--Weather conditions during the first part of April have been for the most part cool, windy, and cloudy. A minimum of 32° F. with a light frost was recorded on the fifth. Frequent strong winds from the south have occurred. Crown rust of oats, Puccinia coronata, was found on April 14 which is ten days later than last year but otherwise one of the earliest infections on record at this station. Leaf rust of wheat continues to spread rather slowly. (April 15).

Stem rust of wheat was found about three miles south of Denton on April 19 by Mr. Wallace Butler, Agent in Stem Rust Investigations. The writer has since searched for rust over a considerable area in the county but no further points of infection can be found. This initial infection must have occurred some time ago as several generations have been completed. No wheat in this area emerged until late in November and after emergence was subjected to another 45 days of very dry weather in which stands were reduced by drought. Favorable precipitation and temperatures soon after January 1 gave wheat its first start. Any suggestion as to when infection occurred would be simply a guess. Reference to meteorological records show that there were a number of days in January when temperatures were high enough to permit infection. The mean temperature in February was 44.7° F. or 3.8 degrees below normal indicating unfavorable conditions for infection. March mean temperatures were 3.5 degrees above normal with morning temperatures sufficiently high on several mornings to permit infection during the time the dew was on plants.

The finding of stem rust on this date is earlier than any previous record of stem rust in this area. Since the infection is not general, this initial infection may not be of unusual importance. (April 20. I. M. Atkins, Division of Cereal Crops and Diseases, Texas Substation No. 6, Denton.)

POWDERY MILDEW ON BARLEY IN CALIFORNIA: This may prove to be the driest of 67 crop years at Davis. Precipitation for the crop year totals only 6.41 inches compared with 26 inches last season and a normal for the July-March period of 16.30 inches. Early in March most grain fields were burning badly. A rain of 1.5 inches on March 8 was very timely, but all grain not on good fallow (or irrigated) is in distress again. The entire Sacramento Valley is similarly affected.

Barley mildew (Erysiphe graminis hordei) is more severe and general than ever noted by any of the California station workers. The disease is causing greater damage in fields suffering from drought, although it is equally abundant in irrigated fields. Only the top 3 or 4 leaves are not completely covered and light infections occur even on the flag leaf. This heavy infection on normally seeded barley is matched by one on late-sown barley which gives every indication that these plants will be killed soon. (C. A. Suneson, March 31. Cereal Courier 31: 25. April 10.)

MACROPHOMINA PHASEOLI ON STROPHOSTYLES HELVOLA IN GEORGIA

Howard W. Johnson

On April 11, 1939 the writer visited the Soil Conservation Service nursery near Americus, Georgia, to investigate a report that seedlings of Strophostyles helvola (L.) Britton were being killed by a disease. Examination revealed that from 5 to 10 percent of the volunteer seedlings on a terrace planted with this wild bean in 1938 were being killed when from 1-1/2 to 2 inches in height by a fungus which was producing pycnidia abundantly on the dead stems and on an occasional dead primary leaf. Material was taken to Experiment, Georgia, where Dr. B. B. Higgins identified the fungus as Macrophomina phaseoli (Maubl.) Ashby. Since no record of the occurrence of this fungus on a Strophostyles exists in the files of the Plant Disease Survey, it is believed that this is a new host record for the fungus. Herbarium specimens are being deposited with the Mycological Collections of the Division of Mycology and Disease Survey, Bureau of Plant Industry and with the Department of Plant Pathology, Georgia Agricultural Experiment Station.

(Division of Forage Crops and Diseases, Bureau of Plant Industry.)

BRIEF NOTES ON PLANT DISEASES

DODDER ON TOMATO IN TEXAS: Typical orange-colored stems of Cuscuta sp. were found on eighteen tomato (Lycopersicon esculentum Mill.) plants in one cold frame at the Tomato Disease Laboratory at Jacksonville, Texas in April 1939. This dodder is being studied to determine its effects on tomatoes and to learn about its host range. (P. A. Young, Texas Agricultural Experiment Station, Tomato Disease Laboratory. April 20.)

DROP OF LETTUCE AND OTHER LETTUCE DISEASES IN NORTH CAROLINA: Lettuce drop caused by Sclerotinia libertiana [S. sclerotiorum] has been very severe this year in fields where lettuce was previously grown in the vicinity of Rowland in Robeson County. Weather conditions during March and the early part of April were very unfavorable for lettuce. Freezing temperatures occurred on March 2 and 3. As a result of these low temperatures, considerable cold injury was evident on March 10. The presence of the drop disease was not evident at this time. Again on March 17, 19, and 20 freezing temperatures occurred. On March 29 approximately 10 percent of the plants were showing definite symptoms of the disease and the causal fungus was very evident. Freezing temperatures again occurred on April 1 and 2. During the period from March 29 to April 11 the disease spread very rapidly. By April 11 approximately 80 percent of the plants were diseased causing an economic loss of from 70 to 80 percent of the crop.

The losses caused by Pythium ultimum and Botrytis cinerea have been heavy also. (O. P. Owens, Assistant County Agent, Robeson County.)

TOBACCO DOWNY MILDEW APPEARS IN VIRGINIA: Blue mold [downy mildew caused by Peronospora tabacina] was found in Mecklenburg County on April 10 and in Charlotte County April 15. A general infection was reported in Halifax County on April 16. On April 18 the disease appeared in the southwest Virginia Burley area in Smith County. Blue mold has also been reported in Nottoway County.

Tobacco plants are generally rather small, and about two weeks later than usual. Weather conditions have been ideal for disease development. (S. B. Fenne, Extension Plant Pathologist. April 22.)